

WE CLAIM:

1. A system for managing virtualized data storage, comprising:

5 a virtualized logical disk object representing a virtual storage container, wherein the virtualized logical disk is an abstract representation of physical storage capacity provided by plurality of physical stores; and

10 a virtual disk object representing a virtual storage container, wherein the virtual disk object is an abstract representation of one or more virtualized logical disk objects, the virtual disk object including an exposed management interface; and

15 wherein the virtual disk object is managed through the management interface to select the one or more logical disk objects represented by the virtual disk object.

2. The system of claim 1 further comprising:

a derived disk object coupled to the logical disk object and including methods and data structures configured to add storage protocol to the logical disk object.

20 3. The system of claim 2 further comprising:

a presented disk object coupled to the derived disk object and including methods and data structures configured to expose an virtual disk interface to selected clients.

4. The system of claim 1 further comprising:

25 a network storage controller including a processor and memory, wherein the logical disk object and virtual disk object are implemented in memory of the network storage controller.

5. The system of claim 4 further comprising a set of persistent objects managed by the network storage controller, wherein the persistent objects represent hardware resources of the network storage system.

5 6. The system of claim 1, further comprising:
a physical store object representing a physical storage device; and

10 a volume object representing storage capacity that can be allocated from the storage device represented by the physical store object, wherein the volume object presents a logical abstraction of the physical store object.

7. The system of claim 1 further comprising:
a storage cell client object representing a host management agent, wherein the storage cell client object has
15 an interface for coupling to the management interface.

8. The system of claim 1 wherein the storage cell client object is capable of representing a host management agent located in any network-coupled computing device.

9. A method for managing virtual storage in a storage
20 area network, the method comprising:

providing at least one network storage controller coupled to a plurality of physical disk drives implementing physical storage capacity;

25 creating a physical store object representing each of the plurality of physical disk drives;

specifying at least some of the plurality of physical disk drives for inclusion in a storage cell;

creating a storage cell object representing the storage cell wherein the physical store objects corresponding to the specified physical disk drives are included in the created storage cell.

5 10. The method of claim 9 wherein the act of specifying comprises:

obtaining user specifications of a required failure protection level; and

10 obtaining user specifications of a set of physical disk drives.

11. The method of claim 10 further comprising creating a volume record on each of the physical disk drives included in the created storage cell.

15 12. The method of claim 9 further comprising creating a management logical disk object storing metadata describing the created storage cell object.

13. The method of claim 9 further comprising:
verifying that at least four physical store objects were specified before creating the storage cell object.

20 14. The method of claim 10 further comprising:
verifying that sufficient physical store objects were specified to satisfy the requested device failure protection level before creating the storage cell object.

25 15. The method of claim 10 further comprising:
verifying that ports on the network storage controller are operational before creating the storage cell object.

16. The method of claim 10 further comprising:
verifying that all of the selected physical store
objects are in an operational condition before creating the
storage cell object.

5 17. A method for facilitating management of virtual
storage in a storage area network enabling a user can
flexibly present a virtual disk to a host, comprising:
connecting a host to a network storage controller (NSC)
via a host agent capable of communicating command-response
10 traffic with logical objects implemented in the network
storage controller;
creating a logical disk object representing a virtual
storage container, wherein the logical disk is an abstract
representation of physical storage capacity provided by
15 plurality of physical stores;
adding a storage protocol to the logical disk object
using a derived disk object in response to a user protocol
selection;
associating the derived object with a host using a
20 presented disk object referencing the host agent in response
to a user host selection; and
creating a virtual disk object comprising the logical
disk object, the derived disk object and the presented disk
object.

25 18. The method of claim 17, further including
providing the user protocol selection and the user host
selection via a management console having a computer
interface and communicating the user selections to the host
agent.